BH 12. In old brick-pit 90 yards S.S.W. of the Charlton road and close to path to Maydencroft Farm. Level (of old surface) 271 feet.

| | | Feet. |
|---|---|---|
| Palæolithic. | Yellow brickearth with small stones (9 feet already removed) | $14\frac{1}{2}$ |
| Ancient alluvium. | Yellow and white marl and silt (compare BH 8) | 2 |
| | Yellow brickearth and small chalk pebbles | $\frac{1}{2}$ |
| Glacial. | Chalky boulder clay | 9 |
| | Loamy chalky gravel | 2 |
| | Gravelly sand | 8 |
| | | 36 |

BH 13. Old gravel pit in Jeeves' Yard, near Black Horse Lane. Level (of old surface) 242 feet.

| | | Feet. |
|---|---|---|
| Glacial. | Coarse gravel, becoming finer below. (Dug) | 18 |
| | Finer gravel, watery below. (Bored) | $10\frac{1}{2}$ |
| | | $28\frac{1}{2}$ |

BH 14 and trial-pit (see p. 44).

## "Luminosity and Photometry." By JOHN BERRY HAYCRAFT, M.D., University College, Cardiff. Communicated by Professor SCHÄFER, F.R.S. Received February 9,—Read March 4, 1897.

The luminosity of the spectrum was determined by what may be termed the method of the "minimal effective stimulus." Through the partition separating two dark rooms from each other a hole was drilled 1 mm. across; this was covered with a piece of ground glass. From a diffraction grating in room A spectral rays of ascertainable wave-length were cast upon the ground glass. The observer in room B was placed upon a graduated railway, and moved towards or from the spot of light until he could just see it, and no more The distances at which various parts of the spectrum were just seen were thus determined, and their relative potencies calculated by the law of inverse squares. Under the above conditions—the eye being in the condition of dark adaptation—the green near E is the most potent, and the violet half of the spectrum is more potent than the red. These results agree with those obtained by Captain Abney who also worked with the dark adapted eye.

The experiment was then repeated, the room B being white-washed, and lit with gas light, and the eye of the observer, therefore, in the condition of light adaptation. Under these conditions the yellow is the most potent, and the red half of the spectrum more potent than the violet.

In the following experiment the eye was in the condition of

light adaptation for strong stimuli, and passed gradually into the condition of dark adaptation as the stimuli became feebler. Tiny discs of coloured paper were pasted on a black background, and the distance determined at which these spots could just be seen. The room in which both the discs and the observer were placed was illuminated by a graduated gas burner reading from twenty candles downwards. For low luminosities when the quality of the flame changes, the burner was raised towards the ceiling to measurable distances.

Order of potency of discs; distance at which they were seen.

| | |
|---|---|
| At high illuminations ..... | Yellow, red, green, blue. |
| ,, low ,, ..... | Yellow, green, red, blue. |
| ,, very low illuminations .. | Green, yellow, blue, red. |

The potency of different portions of the spectrum was also determined by the method of flicker photometry. A semi-disc, rotated by an electromotor between the source of light and the slit of the spectroscope, repeatedly cut off the light entering the instrument. The rate of rotation of the semi-disc was varied by the use of a graduated resistance, and the rate could be accurately determined. At a low speed of rotation the spectrum flickered, except at its ends; the position of these two ends was determined. On increasing the speed of rotation, the flickering centre was narrowed, and another two points were obtained. From a number of such observations a curve, giving the potency of the spectrum to produce flickering, was constructed. With a dim spectrum the green, near E, is the most potent, and the violet half of the spectrum is more potent than the red. On increasing the luminosity of the spectrum, the apex of the curve shifts from the green into the yellow, and the red half becomes more potent than the violet. Flicker curves from coloured papers observed at different luminosities were also obtained. The graduated gas-burner was here utilised, and throughout these experiments, gas-light was used as the source of light. The curves obtained by flicker photometry, and those obtained by the method of the minimal effective stimulus, strikingly resemble each other. The nature of the flicker effect is discussed, and the curves obtained by the above methods are given in a paper shortly to appear in the 'Journal of Physiology.'